

Supplementary Information

Does the lipid environment impact the open-state conductance of an engineered β -barrel protein nanopore?

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Stability of lipid bilayers consisted of different lipid species

DPhPC and DPhPS, whose estimated dimensionless packing parameters (S) are about 1.0, can form a lipid bilayer with capacitance 100~200 pF. SM, whose estimated S is 0.51, cannot form a stable lipid bilayer. Binary mixtures of SM and PC can form a stable lipid bilayer. DPhPE, whose estimated S is 1.20, cannot form a stable lipid bilayer. PE and PC can form stable lipid bilayers. ECTPL, which is a ternary mixture of PE:PG:CL = 6.7:2.3:1, can form a stable lipid bilayer.

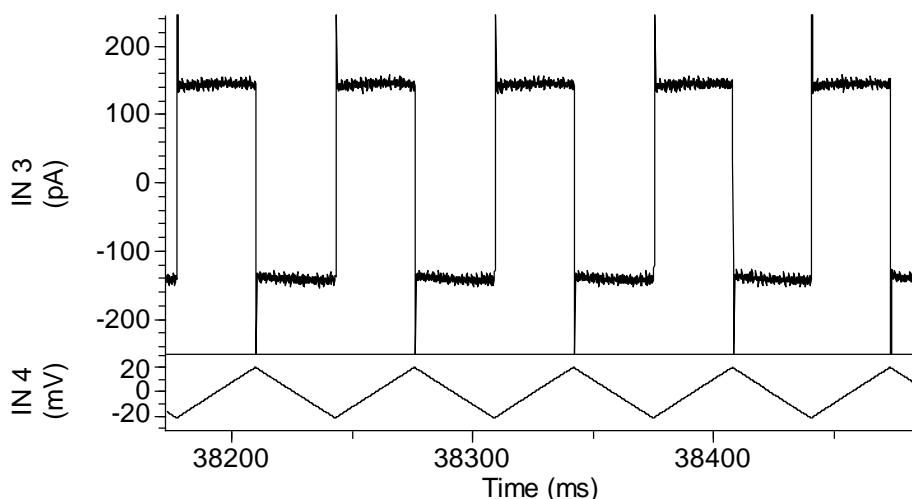


Figure S1: Rectangular current responses to triangular voltage pulses across a stable DPhPC bilayer.

This test indicates the formation of a stable lipid bilayer.

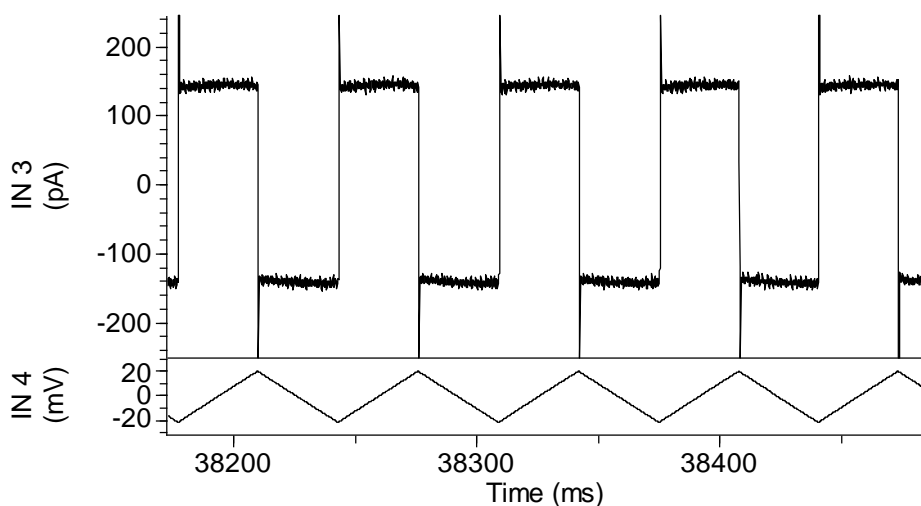


Figure S2: Rectangular current responses to triangular voltage pulses across a stable DPhPS bilayer.

This test indicates the formation of a stable lipid bilayer.

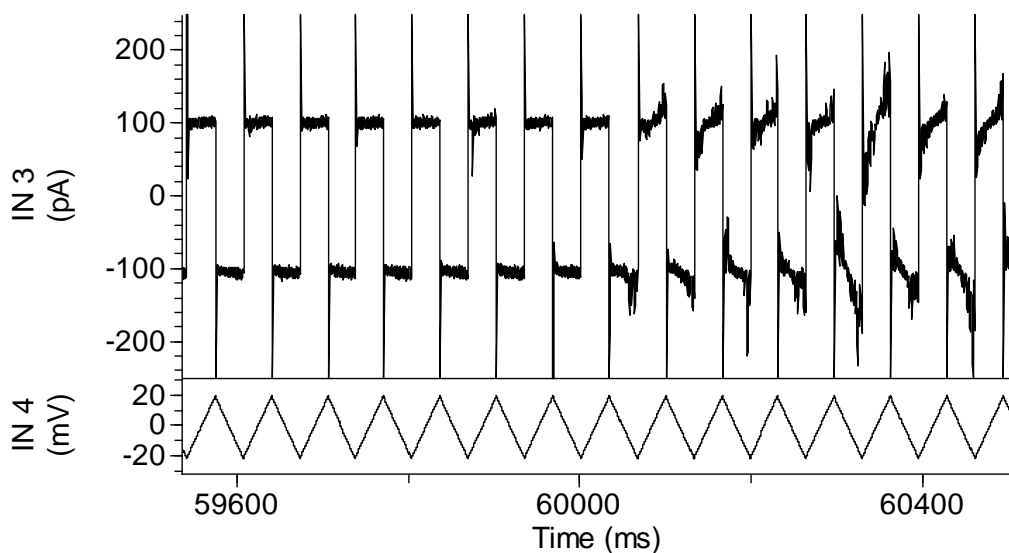


Figure S3: Rectangular current responses to triangular voltage pulses across a SM bilayer. This test indicates the formation of an unstable lipid bilayer.

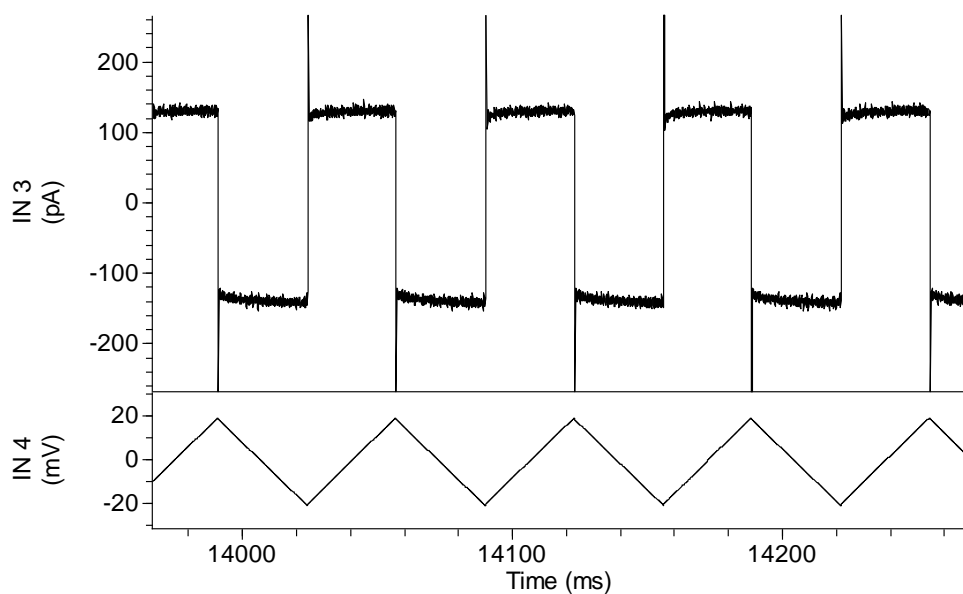


Figure S4: Rectangular current responses to triangular voltage pulses across a lipid bilayer formed by a mixture of SM and DPhPC in a ratio SM:DPhPC=1:1. This test indicates the formation of a stable lipid bilayer.

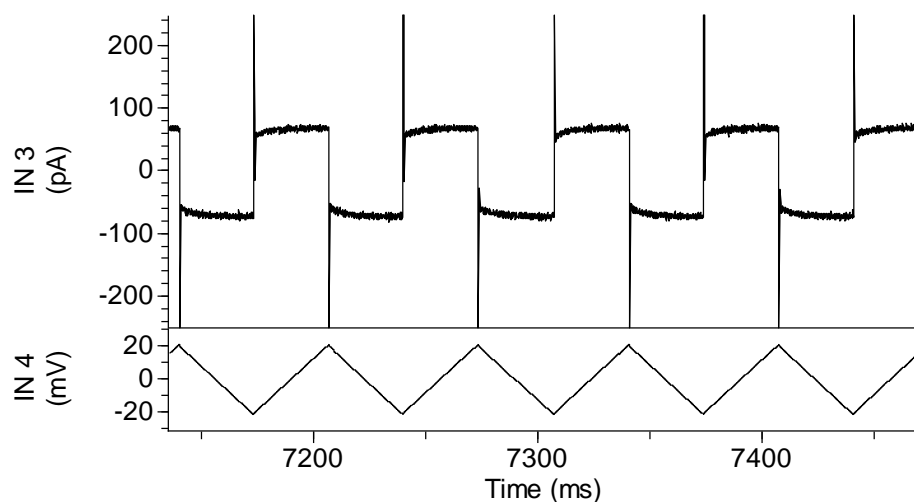


Figure S5: Curved current responses to triangular voltage pulses across a DPhPE bilayer. This test indicates the formation of an unstable lipid bilayer.

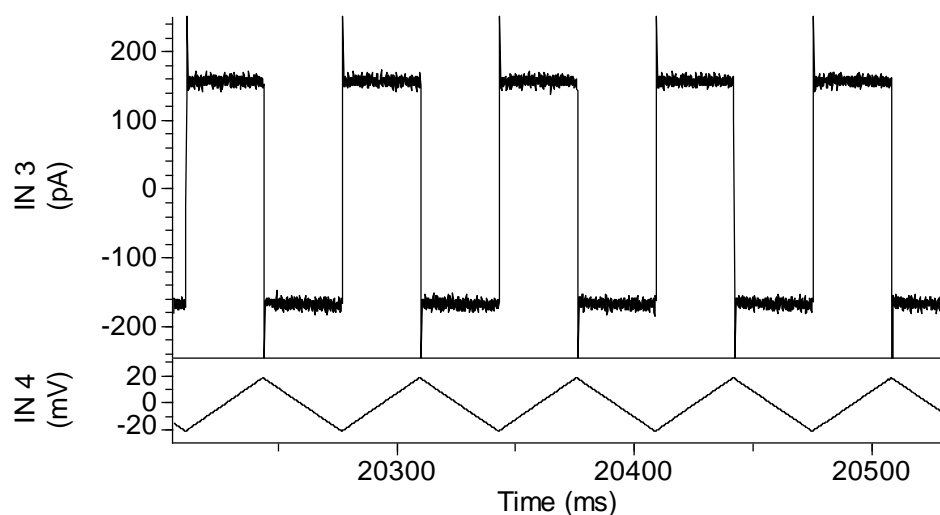


Figure S6: Rectangular current responses to triangular voltage pulses across a lipid bilayer with a mixture of DPhPE and DPhPC in the ratio: DPhPE:DPhPC=3:7. This test indicates the formation of a stable lipid bilayer.

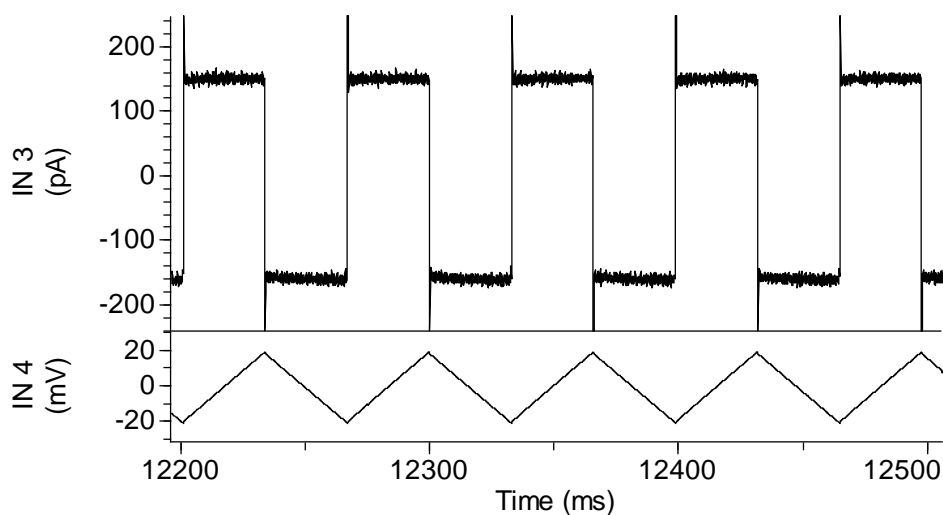


Figure S7: Rectangular current responses to triangular voltage pulses across a stable lipid bilayer with a mixture of DPhPE and DPhPC in the ratio: DPhPE:DPhPC=1:1. This test indicates the formation of a stable lipid bilayer.

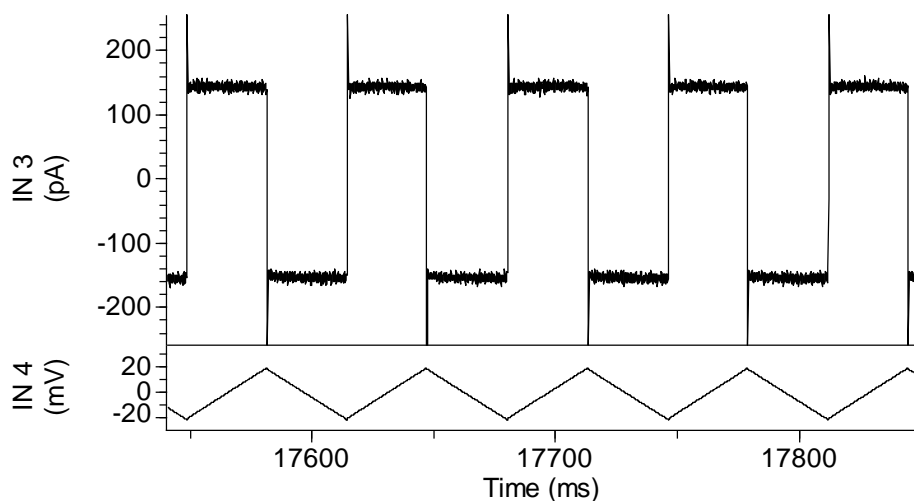


Figure S8: Rectangular current responses to triangular voltage pulses across a stable lipid bilayer with a mixture of ECTPL. This test indicates the formation of a stable lipid bilayer.

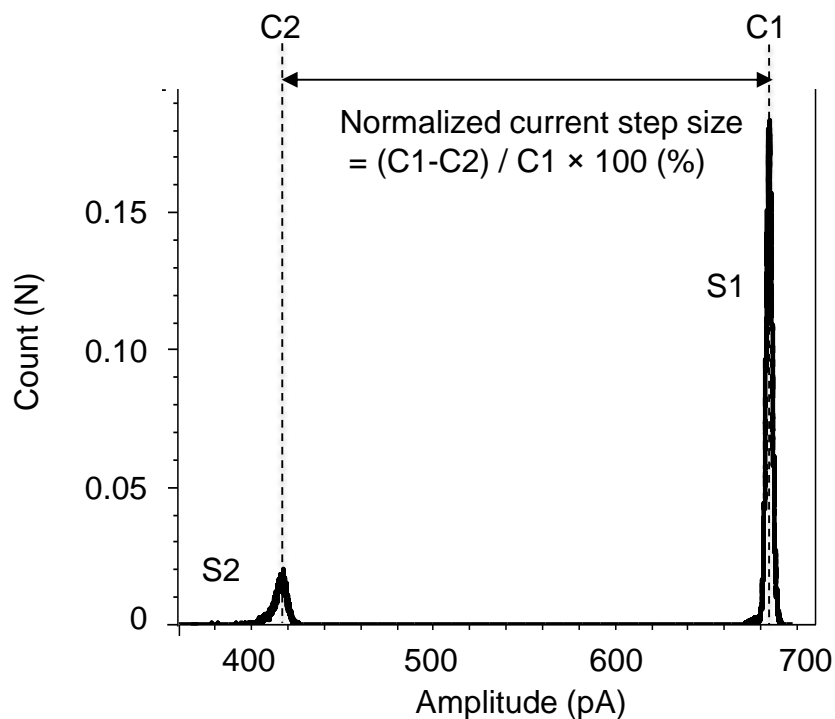


Figure S9: All-points current amplitude histogram derived using the single-channel trace shown in **Fig. 3**. This current histogram selects only current levels S1 and S2. The NCSS is calculated using eqn. (1), as shown in this figure. The single-channel electrical trace was low-pass Bessel filtered at 2 kHz.